

# Claims

- [c1] 1. An automotive vehicle comprising:
- a cargo box;
  - a plurality of roadwheels located under said cargo box;
  - a closure panel for said cargo box, with said closure panel comprising:
    - a door adapted to pivot about a generally horizontal pivot axis, with said door having a shell defining an interior space;
    - a first hinge bearing retainer attached to a first end of said door and having a first bearing insert housed within said retainer;
    - a first pivot post rigidly attached to a structure adjoining a first end of said pivot axis, with said pivot post engaging a bore formed in the interior of said first bearing insert;
    - a second hinge bearing retainer attached to a second end of said door and having a second bearing insert housed therein;
    - a second pivot post rigidly attached to a structure adjoining a second end of said pivot axis, with said second pivot post engaging said second bearing insert such that said second pivot post and said second bearing insert

are rotationally locked; and  
a full floating torsion bar having a first end rotationally grounded within the interior of said door, and a second end engaged with and rotationally locked with said second bearing insert such that said torsion bar will be subjected to torsional loading as said door is pivoted.

[c2] 2. An automotive vehicle according to Claim 1, wherein said torsion bar is subjected to a minimal torsional load tending to open the door when the door is in a closed position.

[c3] 3. An automotive vehicle according to Claim 1, wherein said torsion bar is subjected to a maximum torsional load tending to close the door when the door is in a fully open position.

[c4] 4. An automotive vehicle according to Claim 1, wherein said first end of said torsion bar is grounded to an anchoring member located within the interior of said door.

[c5] 5. An automotive vehicle according to Claim 4, wherein said anchoring member is affixed to a portion of said first hinge bearing retainer.

[c6] 6. An automotive vehicle according to Claim 4, wherein said torsion bar is a straight rod, with the first end of said torsion bar being affixed to an anchoring member

located within the interior of said door.

- [c7] 7. An automotive vehicle according to Claim 1, wherein said second bearing insert comprises a metallic core overmolded with plastic.
- [c8] 8. An automotive vehicle according to Claim 1, wherein said first end of said torsion bar is grounded to an anchoring member located within the interior of said door.
- [c9] 9. An automotive vehicle according to Claim 1, wherein said first bearing insert and first pivot post are keyed so as to allow said closure panel to be removed from a vehicle when the panel has been opened to a predetermined position.
- [c10] 10. A cargo box for a pickup truck, comprising:
  - left and right pickup box sides;
  - a first side pillar attached to said right pickup box side;
  - a second side pillar attached to said left pickup box side;
  - and
  - a tailgate hingedly attached to said first and second side pillars, with said tailgate comprising:
    - a door adapted to pivot about a generally horizontal pivot axis, with said door having a shell defining an interior space;
    - a first cup-shaped hinge bearing retainer attached to a

first end of said door and having a first bearing insert housed within said retainer;  
a first pivot post rigidly attached to said first side pillar, with said pivot post engaging a bore formed in the interior of said bearing insert;  
a second cup-shaped hinge bearing retainer attached to a second end of said door and having a second bearing insert housed therein;  
a second pivot post rigidly attached to said second side pillar, with said second pivot post slidably engaging said second bearing insert such that said second pivot post and said second bearing insert are rotationally locked;  
and  
a full floating torsion bar housed entirely within the interior space of the door, with said torsion bar having a first end rotationally grounded within the interior of said door, and a second end slidably engaged with and rotationally locked with said second bearing insert such that said torsion bar will be subjected to torsional loading as said door is pivoted.

[c11] 11. A cargo box according to Claim 10, wherein said torsion bar is subjected to a minimal torsional load tending to open the door when the door is in a closed position.

[c12] 12. A cargo box according to Claim 10, wherein said torsion bar is subjected to a maximum torsional load tend-

ing to close the door when the door is in a fully open position.

[c13] 13. A cargo box according to Claim 10, wherein said first end of said torsion bar is grounded to an anchoring member located within the interior of said door, with said anchoring member being fastened to a portion of said first hinge bearing retainer such that the anchoring member passes into the interior of the tailgate through a port formed in said shell.

[c14] 14. A cargo box according to Claim 10, wherein said first end of said torsion bar is grounded to an anchoring member located within the interior of said door.

[c15] 15. A cargo box according to Claim 10, wherein said first bearing insert and first pivot post are keyed so as to allow said tailgate to be removed from a vehicle when the panel has been opened to a predetermined position.

[c16] 16. A method for constructing a cargo box for a pickup truck, comprising the steps of:  
fabricating a box having left and right sides and a floor;  
fabricating a door adapted to pivot about a generally horizontal pivot axis, with said door having a shell defining an interior space, and with said shell having a first end and a second end;

attaching a first hinge bearing retainer to said first end of said shell, and positioning a first bearing insert within said retainer;

providing a first pivot post rigidly attached to a first cargo box rear side pillar adjoining said first end of said shell when the door is in a closed position, with said first pivot post engaging a bore formed in the interior of said first bearing insert;

providing a second hinge bearing retainer attached to a second end of said shell and having a second bearing insert housed therein;

providing a second pivot post rigidly attached to a second cargo box rear side pillar adjoining said second end of said door shell when the door is in a closed position, with said second pivot post engaging said second bearing insert such that said second pivot post and said second bearing insert are rotationally locked; and

providing a full floating, generally straight torsion bar housed entirely within the interior space of the door, with said torsion bar having a first end rotationally grounded within the interior of said door, and a second end engaged with and rotationally locked with said second bearing insert such that said torsion bar will be subjected to torsional loading as said door is pivoted, and with said torsion bar being inserted axially into said door.

[c17] 17. A pickup truck with a cargo box, comprising:  
a plurality of roadwheels;  
left and right pickup box sides mounted over said roadwheels;  
a first side pillar attached to said right pickup box side;  
a second side pillar attached to said left pickup box side;  
a first pivot post attached to said first side pillar;  
a second pivot post attached to said second side pillar;  
and  
a tailgate hingedly attached to said first and second pivot posts, with said tailgate having a full floating torsion bar lift assist, with said torsion bar having a first end rotationally grounded within the interior of said tailgate, and a second end rotationally locked with said second pivot post such that said torsion bar is subjected to torsional loading as said tailgate is pivoted to an open position.